




UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,556	10/23/2001	Martin Klein	H 2182	4171
1218	7590	07/26/2004	EXAMINER	
CASELLA & HESPOS 274 MADISON AVENUE NEW YORK, NY 10016			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/047,556	Applicant(s) KLEIN ET AL.	
	Examiner Shun Lee	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004 and 24 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6 and 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6 and 8-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0504</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 24 October 2000. It is noted, however, that applicant has not filed a certified copy of the 00 122 360.1-2208 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

2. The information disclosure statement filed on 20 May 2004 does not fully comply with the requirements of 37 CFR 1.98 because: of illegible copies (*i.e.*, Vellettaz *et al.* is missing pages 77-79 and Spector *et al.* is missing pages 527 and 529). Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered. See 37 CFR 1.97(i).

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 5, 6, 8, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson *et al.* (US 6,429,578) in view of Sauli (US 6,011,265).

In regard to claim 11, Danielsson *et al.* disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) a converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) for a detector for detecting electrically neutral particles, having a first conductive layer (704) and a second conductive layer (712), which are electrically insulated from one another by an insulator layer (706, 710) arranged between them (*i.e.*, the first conductive layer (704) and the second conductive layer (712)), the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) having a multiplicity of passages for the electrically

charged particles (column 6, lines 14-16). While Danielsson *et al.* further disclose (Figs. 7a and 7b) that at least one converter layer (708) can be integrated into a GEM structure (704, 706, 710, 712), the device of Danielsson *et al.* lacks an explicit description that the at least one converter layer is arranged on at least one of the first conductive layer and the second conductive layer. However, GEM structures with an integrated converter layer are known in the art. For example, Sauli teaches (Fig. 10) that a GEM structure (11, 10, 12) with an integrated converter layer (PhC) arranged on at least one of the first conductive layer (11) and the second conductive layer (12) minimizes damage to the converter layer from positive ions (column 23, lines 36-44). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to integrate the at least one converter layer in the device of Danielsson *et al.* onto at least one of the first conductive layer and the second conductive layer, in order to minimize damage to the converter layer from positive ions.

In regard to claims 1 and 2, Danielsson *et al.* in view of Sauli is applied as in claim 11 above. Danielsson *et al.* also disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) a detector for detecting electrically neutral particles, having

- (a) a detector housing (column 7, lines 2-14) which at least in certain regions is filled with a counting gas,
- (b) a multiplicity of the converter devices (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) arranged in cascade form in the detector housing for generating conversion products (e.g., electrons; column 7, lines 49-54) as a result of the absorption of the neutral particles (e.g., neutrons; column 13, lines 9-11) which are

to be detected, the conversion products generating electrically charged particles (e.g., electrons; column 7, lines 54-56) in the counting gas,

(c) at least one readout device (314, 914) for detecting (column 8, lines 36-50) the electrically charged particles; and

(d) at least one electrical drift field device (200, 304a, 304b, 304c, 304d, 304e, 306, 700, 904a, 904b, 904c, 904d, 904e, 906) for generating an electrical drift field for the electrically charged particles in at least a region of the volume of the counting gas in such a manner that at least some of the electrically charged particles drift (i.e., charge collect; column 8, lines 25-35) toward the readout device (314, 914), the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) being of charge-transparent design (i.e., perforated; column 7, lines 39-47) and being arranged in the detector housing in such a manner that the drift field passes through at least part of the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d).

In regard to claim 3 which is dependent on claim 2, while Danielsson *et al.* also disclose (column 7, lines 39-41) that the passages are aligned with the holes in the GEM structure, the detector of Danielsson *et al.* lacks an explicit description that the passages have a minimum diameter of between 10 μm and 1000 μm , and a minimum spacing of 10 μm to 500 μm . However, GEM structures are known in the art. For example, Sauli teaches (Fig. 4f; Tables 1 and 3) that a GEM structure have diameters D of for example, 110 μm and 130 μm , and a minimum spacing P of 140 μm to 200 μm . Therefore it would have been obvious to one having ordinary skill in the art at the time

Art Unit: 2878

of the invention to provide passages in the detector of Danielsson *et al.* having a minimum diameter of between 10 μm and 1000 μm , and a minimum spacing of 10 μm to 500 μm , in order to align the passages to the holes in the known GEM structure.

In regard to claim **5** which is dependent on claim 1, Danielsson *et al.* also disclose (Figs. 3 and 9) that a region of the converter device (302a, 302b, 302c, 302d, 700, 902a, 902b, 902c, 902d) which is active in the conversion is arranged substantially perpendicularly in the drift field.

In regard to claim **6** which is dependent on claim 1, Danielsson *et al.* also disclose (Figs. 2a, 2b, 3, 7a, 7b, and 9) that the device (200, 304a, 304b, 304c, 304d, 304e, 306, 700, 904a, 904b, 904c, 904d, 904e, 906) for generating a drift field has a structured drift electrode (206, 208, 306, 704, 712, 906) to generate the drift field between the drift electrode and the readout device (314, 914).

In regard to claim **8** which is dependent on claim 7, Danielsson *et al.* also disclose (Figs. 7a and 7b) that the first conductive layer (704) and the second conductive layer (712) are electrically connected to a device for generating a converter field.

In regard to claim **13**, the method steps are implicit for the modified apparatus of Danielsson *et al.* since the structure is the same as the applicant's apparatus of claims 1 and 2.

In regard to claim **14**, the method steps are implicit for the modified apparatus of Danielsson *et al.* since the structure is the same as the applicant's apparatus of claims 1 and 2.

Art Unit: 2878

7. Claims 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson *et al.* (US 6,429,578) in view of Sauli (US 6,011,265) as applied to claims 8 and 11 above, and further in view of Gleason (US 3,956,654).

In regard to claim **9** (which is dependent on claim 8) and claim **12** (which is dependent on claim 11), while Danielsson *et al.* also disclose (column 13, lines 9-11) that the converter layer is a neutron converter layer, the modified apparatus of Danielsson *et al.* lacks an explicit description that the neutron converter layer contains at least one of lithium-6, boron-10, gadolinium-155, gadolinium-157 and uranium-235. However, neutron converter layers are well known in the art. For example, Gleason teaches (column 1, lines 9-36) that boron-10 is a widely used converter layer for detecting neutrons. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide boron-10 for the converter layer in the modified apparatus of Danielsson *et al.*, in order to detect neutrons.

In regard to claim **10** which is dependent on claim 9, Danielsson *et al.* also disclose (column 6, lines 24-56) that the first and second conductive layers have a layer thickness of 5 μm (*i.e.*, from 0.1 μm to 20 μm) and the insulator layer has a layer thickness of 50 μm (*i.e.*, from 10 μm to 500 μm). The modified detector of Danielsson *et al.* lacks that the neutron converter layer has a 0.5 μm and 3 μm layer thickness. However, neutron converter layers are well known in the art. For example, Gleason teaches (column 1, lines 9-36) that a neutron converter layer comprises an absorptive coating of a material having a high neutron cross-section such as boron-10. In addition, Danielsson *et al.* further disclose (column 13, lines 9-11) that the detector

can be optimized for detecting neutrons as is known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to optimize the thickness (e.g., from 0.5 μm and 3 μm) of a boron-10 absorptive coating as the converter layer in the modified detector of Danielsson *et al.*, in order to detect neutrons with a desired efficiency.

Response to Arguments

8. Applicant's arguments filed 20 May 2004 have been fully considered but they are not persuasive.

In response to applicant's argument (pg. 13-15 of remarks filed 20 May 2004) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, that only a single insulator layer is arranged between first and second conductive layers) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

For example, amended independent claim 1 recites the limitation of "each of said converter devices comprising a first conductive layer and a second conductive layer, which are electrically insulated from one another by an insulator layer arranged between the first conductive layer and the second conductive layer, and at least one converter layer arranged on at least one of the first conductive layer and the second conductive layer to define an outermost part of the respective converter device". Thus claim 1 does

not include a limitation wherein only a single insulator layer is arranged between first and second conductive layers. Therefore, applicant's arguments are not persuasive.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2878

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL


DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800